

# NEWSLINE

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**LAB ANNOUNCEMENTS****NAI realigns to changing security environment**

By *Stephen Wampler*  
Newsline staff writer

A realignment of the Laboratory's Nonproliferation, Arms Control and International Security (NAI) directorate has been unveiled by Associate Director Ray Juzaitis.

The changes, announced March 20 during a packed, all-hands meeting of NAI employees in the Bldg. 123 auditorium, will take effect May 1.

"Our realignment was dictated by the need to address the dynamic nature of the changing global security environment as well as to better support our major sponsors," Juzaitis said.

One of the directorate's changes is a new name — the Nonproliferation, Homeland and International Security directorate, or NHI.

"This new name captures both the increased emphasis on homeland security and the continuing importance of the directorate's missions in nonproliferation and international security," Juzaitis said.

Nonproliferation and homeland security, however, are not viewed by Juzaitis and his management team as different programs, but as efforts that are highly integrated.

With the realignment taking effect on May 1, Juzaitis stressed that it is important during the transition for employees to carefully and explicitly consider the safety and security issues involved in the changeover.

An important development in the realignment is the formation of a new division focused on chemical and biological countermeasures.



**Ray Juzaitis**

The new Chemical and Biological Division will develop and support the deployment of technologies and systems that strengthen the nation's ability to protect against, respond to, and recover from the use of chemical or biological agents. The Lab's Chemical and Biological National Security Program (CBNP) will be a major component of the new division.

"We felt, given the recent growth and prospective growth opportunities, that the biological and chemical countermeasures efforts needed its own special focus," Juzaitis said. "We are also interested in forming a tighter alliance with the Lab's Biosciences Directorate."

Over the past four years, Livermore's CBNP effort has grown significantly, from

a fiscal year 2001 budget of \$17 million to a FY 2005 budget of about \$75 million.

In a development separate from the directorate's realignment, CBNP leader Pat Fitch has accepted a new position with Ohio-based Battelle Memorial Institute.

"We are deeply appreciative of the superlative job that Pat has done as the head of the Lab's CBNP effort," Juzaitis said. "He has helped to position Livermore as a national leader in the biological and chemical detection fields and we wish him all the best with this new opportunity."

Albert Ramponi, deputy associate director for the Biosciences Directorate (who will continue in that position during this transition period), has been named the interim head of the CB Division.

Bill Colston, deputy leader for CBNP and director of the Biodefense Knowledge Center (BKC), has been tapped to be the interim CB Division deputy leader. Colston will continue to lead the BKC during the transition.

All of the directorate's division leader appointments have been made acting. The positions will be posted for internal and external candidates, and Juzaitis anticipates filling the slots by mid-summer, or sooner, if possible.

Beyond the CB Division, the other four NHI divisions and their acting leaders will be:

- Z Division, or Intelligence Analysis and Knowledge Discovery, providing assessments, expertise and technologies that enhance the nation's ability to anticipate, detect and thwart weapons of mass

destruction (WMD) proliferation and terrorism. C. Wes Spain will lead Z Division.

- NP Division, or Nonproliferation and Global Nuclear Material Management, providing technical capabilities for preventing, limiting and detecting the spread of WMD and enabling the implementation of U.S. nonproliferation policy. Jeffery Richardson will direct the NP Division.

- RN Division, or Radiological and Nuclear Countermeasures, developing and supporting the deployment of technologies and systems that strengthen the nation's ability to protect against, respond to and recover from the use of radiological or nuclear weapons. Harry Vantine will head the RN Division.

- IP Division, or Infrastructure and Force Protection, developing and supporting the deployment of technologies and systems that strengthen the nation's ability to hold foreign proliferation infrastructures at risk and to protect domestic critical infrastructures and military forces. Greg Simonson will direct the IP Division.

Although the IP Division will be strongly focused on research for the Department of Defense, Juzaitis indicated that the division will be important for exploiting synergies between DoD and the Department of Homeland Security in infrastructure protection. With its modeling and analysis work, the division will perform infrastructure assessments and consider protection for the transportation, chemical, nuclear and other industries.

"The program activities are being

*See NAI, page 8*

**Call for LDRD Strategic Initiative proposals for fiscal year 2007**

The invitation to submit proposals for the fiscal year 2007 Laboratory Directed Research and Development (LDRD) Strategic Initiative (SI) category has been issued. The SI is one of the four categories comprising the LDRD Program and emphasizes innovative R&D activities to develop new directions for existing programs, explore new concepts, and extend the Laboratory's science and technology foundations.

The SI competition is open to all Laboratory programmatic, scientific, engineering, and technical staff. The deadline for submitting full proposals for both currently funded and new SIs to the Laboratory Science & Technology Office (LSTO) is close of business, Friday, May 19.

The FY07 process for submitting

**LDRD Directorate points of contact**

**Biosciences**  
**Chemistry and Materials Science**  
**Computation**  
**Defense and Nuclear Technologies**  
**Energy and Environment Directorate**  
**Engineering**  
**National Ignition Facility Programs**  
**NAI**  
**Physics and Advanced Technologies**  
**Safety and Environmental Protection**  
**University Relations Program**

**Albert Ramponi (3-3363)**  
**Judy Kammeraad (3-6757)**  
**David Brown (4-3557)**  
**Denise Hinkel (3-2626)**  
**Norm Burkhard (2-6483)**  
**Greg Suski (3-8070)**  
**Chris Barty (3-8486)**  
**David Dye (2-5036)**  
**Alan Wootton (2-6533)**  
**Jesse Yow (2-3521)**  
**Harry Radousky (2-4478)**

new SI proposals begins with a three-page pre-proposal that provides a summary of the objectives, goals and potential benefits of the proposed work, the project's principal investigator and team and the requested funding. The pre-proposal should be submitted to Laboratory Science and Technology Office through the

investigator's directorate office by Friday, April 14. The pre-proposals will be reviewed to select those that will go forward to the next step in the process.

Full proposals should not exceed 25 pages and should include an abstract, background and significance, detailed discussion of FY06 accomplishments (for continuing projects), research design and methods, and specific proposed goals and milestones for FY07.

Detailed information about submittals, including proposal guidance, is available on the LSTO Website at <https://lsto.llnl.gov/Proposals/ProposalHome.pl> under FY07 Strategic Initiatives, by contacting Nancy Campos at 2-9805, or through your directorate point of contact.

## IN PROFILE

# Pilot project screens vehicles for explosives

By Stephen Wampler  
Newsline staff writer

For the past several weeks, drivers entering New York City have been undergoing random screening for the past several weeks to see if they're carrying explosives.

The new pilot program, called the Vehicle-Borne Improvised Explosive Device Campaign, is designed to evaluate technologies and procedures to interdict terrorists attempting to transport explosives.

Funded with more than \$1 million from the Department of Homeland Security's CounterMeasures TestBeds (CMTB) Program, the effort is led by LLNL researchers and includes partners from two other laboratories and the Port Authority of New York and New Jersey.

Other participating laboratories are the Environmental Measurement Laboratory of New York City and the Transportation Security Laboratory of New Jersey.

"The intent of the program is to evaluate the effectiveness of explosives detection technologies in a roadway environment," said LLNL's Drew Casavant, the program manager. "Imagine thousands of vehicles traveling past a checkpoint and identifying which one is transporting explosives."

During the coming months, vehicles will be randomly selected to undergo screening for explosives using particulate sampling to look for explosive residue, according to Casavant.

Under the pilot program, the researchers and Port Authority personnel



JACQUELINE MCBRIDE/NEWSLINE

**Jeremiah Gruidl, a technician in the Lab's Nonproliferation, Arms Control and International Security directorate (left), analyzes a particulate sample potentially containing explosives during an operational test. Looking on are Fabien Raccach (middle) of the Department of Homeland Security and Raymond Cantelmo, a Port Authority of New York and New Jersey police officer.**

are assessing their ability to detect minute traces of explosives in a highway environment that is saturated with vehicle exhaust and grime, and where weather conditions can range from fog, rain, sleet and snow to hot and humid summers.

Some of the questions that Casavant said the team hopes to answer include how well explosives can be detected, the

rate of false alarms, how quickly vehicles can be moved through checkpoints and the reliability of the detection equipment.

Since the program started last July, the team has analyzed a variety of explosive detection systems, selected equipment for deployment, developed concepts of operations and detailed test protocols and trained operators.

Nine Port Authority police officers, including a procurement and logistics expert, visited the Laboratory in late January for training on the operation and maintenance of the explosive detection equipment. They were pleased with the training they received.

"It's been excellent," said Port Authority Lt. Thomas Marten. "It's been so informative. We've almost been blown away by some of things we've seen."

Port Authority Sgt. John O'Donnell called the training very good and informative. "We deal with much of the transit between New York and New Jersey and since Sept. 11 the concerns of terrorism have become very important to us."

The purpose of the two-day training session, Casavant said, was to explain the pilot program objectives, the available technologies and the equipment that has been selected for evaluation.

"The Port Authority officers told us they got a lot out of the training exercise," Casavant said. "They were unaware of all of the available technology and products, and were very happy that a national lab was helping them find the best technology fit for their application."

Test results will be shared with manufacturers to help them increase product effectiveness, which is one of the key missions of the CMT. Future phases of the program are expected to focus on "lessons learned" and the deployment of advanced technologies, as well as expanding efforts to other cities and other modes of transportation.

## DDLS speakers mark San Francisco earthquake centennial

The Laboratory will mark the centennial of the San Francisco earthquake Wednesday, April 5, with two Director's Distinguished Lecturer Series presentations.

Kevin Starr, professor of history at the University of Southern California, will present, "The San Francisco Earthquake and Fire of April 1906 – Lessons Learned," and Mary Lou Zoback, senior research scientist at the U.S. Geological Survey, will discuss "A Century of Progress in Understanding Earthquakes and Their Effects," at 2:15 p.m. in the Bldg. 123 auditorium.

Perhaps more than any other time in our history, Americans today are aware of catastrophe as an ongoing threat. When we look back to the San Francisco earthquake and fire of April

1906, we are examining more than history. We are looking at present and future possibilities, as it is almost inevitable that another earthquake of comparable magnitude will occur in the Bay Area. Starr will examine the essential lesson from the 1906 earthquake — that a society's response to catastrophe reflects that society's functionalism or dysfunctionality.

Next, Zoback will discuss the 1906 earthquake as marking the birth of modern earthquake science in the United States. For the first time, the effects of a major seismic event were systematically investigated and documented.

Geologists realized that the San Andreas Fault was a continuous, active geologic feature, and that the quake was not a random event but part of an

ongoing process. Today, a repeat of the 1906 quake is only one of many seismic scenarios likely in Northern California. The talk concludes with a discussion of Earth Scope, a new initiative that is analyzing fault interactions to identify the warning signs of the next big earthquake.

Starr, California State Librarian Emeritus, has a Ph.D. in American literature from Harvard University. Starr has served as executive assistant to the mayor of San Francisco and as city librarian of San Francisco. Columnist and author of numerous newspaper and magazine articles, Starr has written or edited 14 books. His writing has won him a Guggenheim Fellowship, membership in the Society of American Historians, and the Gold Medal of the Commonwealth Club of California.

Zoback has a Ph.D. in geophysics from Stanford University. Her primary research interest is the relationship between earthquakes and stress in the Earth's crust. She is a past president of the Geological Society of America and currently serves on the Council of the National Academy of Sciences. She was awarded the American Geophysical Union's Macelwane Award in 1987 and in 1995 was elected into the National Academy of Sciences.

The talks will be followed by a poster and simulation session by LLNL scientists.

The presentations will be rebroadcast at 9:30 a.m., noon, 2:30, 5, and 8 p.m. Thursday, April 13, and 4 a.m. Friday, April 14, on Lab TV channel 2.

## SCIENCE NEWS

# Oxygen breathed life into biological evolution

By Charlie Osolin  
Newsline staff writer

It's common knowledge that humans and other animals couldn't survive without oxygen. But scientists are now learning a good deal more about the extent of our evolutionary debt to a substance that was once a deadly poison.

New research at the Laboratory and Boston University shows that many of the complex biochemical networks that humans and other advanced organisms depend on for their existence could not have evolved without oxygen.

"You could call it the 'oxygen imperative,'" said postdoctoral researcher Jason Raymond. "It's clear that you need molecular oxygen to evolve complex life as we know it."

"Researchers have spent decades putting together maps of how the building blocks of life connect to each other," added Daniel Segrè of Boston University, who holds a joint appointment in the Laboratory's Biosciences Directorate. "It turns out that whole regions in this map may not have existed without oxygen."

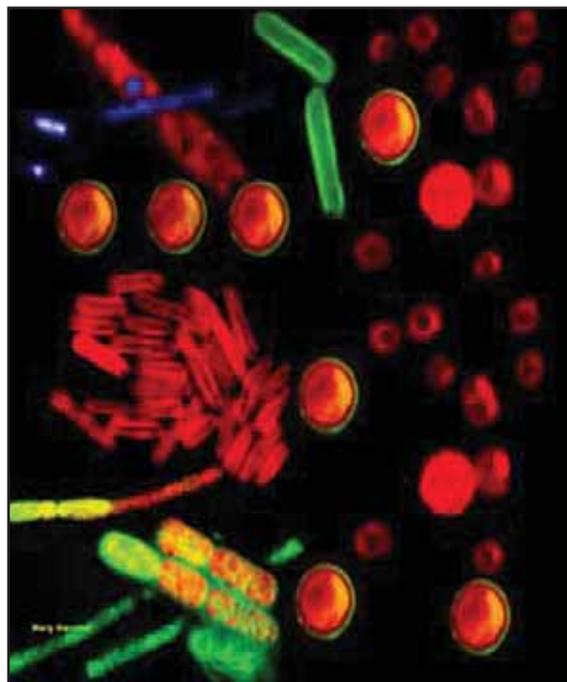
Raymond and Segrè used computer simulations to study the effect of oxygen on metabolic networks — the biochemical systems that enable organisms to convert food and nutrients into life-sustaining energy. Their analysis shows that the largest and most complex networks — those found in humans and other advanced organisms — require the presence of molecular oxygen. The research is reported in the March 24 issue of the journal *Science*.

"We wanted to look at how the availability of oxygen changed the types of chemical reactions," Raymond said, "both with respect to metabolites (metabolism byproducts) and to the enzymes needed to carry out metabolism."

Raymond and Segrè calculated the number of possible combinations of the thousands of enzymes and chemicals involved in all known metabolic reactions across the tree of life, and came up with a "virtually limitless" number — 10 to the 16,536th power. Simulating that many networks would be an impossible task even for the Laboratory, which houses the world's most powerful supercomputers.

To make the project manageable, the researchers used a statistical technique called Monte Carlo to randomly sample and simulate about 100,000 networks. "We found that all the different types of networks fell into four different clusters of increasing size and connectivity, and in networks within the largest clusters, molecular oxygen was always present," Raymond said.

The smaller, simpler networks encompass anoxic, or oxygen-free, pathways common to all life, from single-celled bacteria to the largest mammals. "All this information can be gathered by analyzing the many genomes



**Fluorescence micrographs of cyanobacteria. About 2 billions years ago, cyanobacteria — oxygen-producing photosynthetic prokaryotes that used to be called blue-green algae — were responsible for launching the process that increased the concentration of atmospheric oxygen from less than 1 percent to about 20 percent today, making possible the evolution of humans and other animals.**

already sequenced and publicly available," Segrè said.

"Certain processes were essential to the development of the earliest cellular life," Raymond said. "And the most basic, intrinsic reactions organisms need to survive persist today. For example, how we break down glucose (sugar) has been remarkably well conserved for billions of years."

For higher life forms to evolve, however, additional processes were needed, such as the ability to synthesize, or break down, steroids and alkaloids — and those require oxygen. But until about 2 billion years ago, Earth's atmosphere was mostly carbon dioxide, sulfur dioxide and nitrogen; only about one-tenth of 1 percent was oxygen. The first microorganisms derived their sustenance from amino acids, hydrogen sulfide, organic carbon and similar hard-to-get substances. Not only was oxygen unnecessary, it was toxic to early organic life.

But about 2.2 billion years ago, a remarkable transformation took place. Cyanobacteria, also known as blue-green algae, learned how to do oxygenic photosynthesis — using sunlight, carbon dioxide and water to produce sugar and other carbohydrates, and giving off oxygen as a byproduct. Thanks to the abundance of all three substances, the cyanobacteria thrived, and the oxygen they produced began to fill the ocean and the atmosphere.

Today, due to the photosynthetic action of both bacteria and plants, oxygen makes up about 20 percent of the Earth's atmosphere.

"Things starkly changed when cyanobacteria evolved," Raymond said. "The atmosphere became deadly to all the microorganisms that were around at the time. It would have been cataclysmic for life — the existing bacteria either had to retreat (into the deep ocean) or adapt to use oxygen."

Fortunately for us, many organisms did adapt, either

“Life as we know it was kick-started a few billion years ago by the oxygen-producing microbes”

— Jason Raymond

on their own or through horizontal gene transfer — when one species, in effect, “steals” a gene and its molecular function from another. An important example of this was the ability of early life to derive energy from oxygen by “capturing” oxygen-using bacteria inside their cells, which ultimately became mitochondria (the cell’s energy-generating “power plants”).

That adaptation may have marked the beginning of complex life on Earth. What’s more, recent research suggests that a sharp rise in atmospheric oxygen about 50 million years ago was the evolutionary boost that enabled mammals to grow in size and ultimately dominate the planet.

“Oxygen is the high-energy reactant that we need to grow into big, complex, multi-cellular organisms,” Raymond said. “So life as we know it was kick-started a few billion years ago by the oxygen-producing microbes.”

The new findings also may imply that oxygen would be a good proxy for the search for intelligent life elsewhere in the universe. “If you can detect oxygen or ozone in the atmosphere, that would be a great marker, along with water, for finding a habitable planet,” Raymond said.

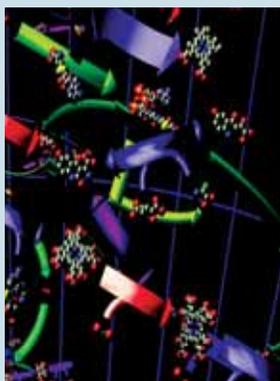
Raymond and Segrè’s findings suggest that additional evolutionary secrets might be uncovered through the study of metabolic networks.

“We will go back and look at the evolutionary history of the development of enzymes and metabolites to see how the process evolved over time,” Raymond said. “There’s lots more information available to be mined, not just with respect to oxygen, but also other contingencies in the evolution of metabolism — for example, how the metabolic networks have changed over time in response to things like vitamins.”

“Looking at networks that integrate information from many different organisms,” Segrè added, “also may prove to be crucial for understanding the dynamics and evolution of complex ecosystems, such as the microbial communities revealed by metagenomic sequencing.”

Raymond holds a Ph.D. in chemistry from Arizona State University. He joined the Laboratory in the summer of 2004 as a Lawrence Fellow, and his Lawrence fellowship helped support the research. Segrè is an assistant professor of bioinformatics in the Biology and Biomedical Engineering departments at Boston University and a faculty scholar at LLNL.

**ON THE COVER:** Simulating biological networks in the presence or absence of specific metabolites, such as molecular oxygen, provide new insights into the evolution of life’s chemical capabilities. Credit: This image of one such simulation was created by LLNL postdoctoral researcher Jason Raymond.



SCIENCE NEWS

# New Livermore venue offers even greater science fare



**Kimberly Freid, junior division sweepstakes winner and eighth-grade student from Valley Christian School talks with judge Pat Coyle about her project, "How Does Center of Gravity Affect Cranes?"**



**Niharika Bhatnagar, a student at Iron Horse Middle School in San Ramon, demonstrates "Effect of Mass and Length on Time Period of Pendulum," her entry in the science fair's junior category.**

*By Linda Lucchetti  
Newsline staff writer*

This week, seasoned scientists and engineers challenged budding scientists on their projects' hypotheses and conclusions at the annual Tri-Valley Science & Engineering Fair.

The Laboratory, a long-time sponsor of the fair, celebrated 10 years of the competition at Livermore's newly constructed Robert Livermore Community Center.

More than 300 students in grades 7 through 12 from Danville, Dublin, Livermore, Pleasanton, San Ramon, and Sunol districts marched into the facility on Wednesday to present their projects and compete for cash and other prizes. Awards were distributed that evening. Lab Associate Director Tomas Diaz de la Rubia gave the keynote address, encouraging students to pursue their education and career choices in science and engineering.

Linda Ault, a physicist and Lab retiree, served as a project judge, reviewing the works of some 15 students.

"It's great to see the ingenuity of the students," she said. "I've been participating for the past ten years and their projects continue to get better."

Ault attributes the sophistication of the science projects to the many resources now available to students. "I'm sure that the internet plays a big role."

Stephanie Fitch, a Granada High



*Photos by Jacqueline McBride, Newsline*

**Mina Bionta, senior division sweepstakes winner and twelfth-grade student from Livermore High School, discusses her project "The Ever-Changing San Francisco Bay Delta" with judge Cal Wood. Bionta was also a senior sweepstakes winner at the 2005 Tri-Valley Science and Engineering Fair.**

School junior with hopes of a future career in medicine was a first time participant. "The fair is great. I have a real positive impression," she said. Fitch's project compared real sugar with the sugar substitute "Splenda."

Tom McLaughlin, a Livermore school board member who visited the proceedings said he was very impressed with the young participants. "This is a fantastic challenge — it really shows others what they are capable of doing," he said. "The Lab provides a way for the students to talk with professionals who do science on a greater scale. Students then have people to look up to."

After several hours of deliberation, it all came down to the decisions of more than 130 judges — the majority

participating from LLNL. The following students won top honors:

The Senior Division Sweepstakes winners of the fair were: Mina Bionta, a 12th-grade student from Livermore High School whose project was "The Ever-Changing San Francisco Bay Delta," and Farnoosh Nik-Ahd, an 11th-grade student from California High School, whose project was "Role of Keratin Mutations as Susceptibility Genes for Liver Disease in Afro Americans."

Sweepstakes winners in the senior division category are eligible to participate in the Intel International Science and Engineering Fair in Indianapolis in May.

Also winning in the Junior Division category were: Kimberly Freid, 8th-grade student from Valley Christian School, with the entry, "How Does Center of Gravity Affect Cranes?" and Lakshimi Vijanderan, an 8th-grade student from Pine Valley Middle School with the project "Can You Feel the Heat in Your Feet?"

Junior Division winners are eligible to compete at the California State Science Fair.

Sweepstakes winners in both junior and senior divisions also received a \$500 cash award from the Laboratory.

The public is invited to view the student projects at the Robert Livermore Community Center, 4444 East Ave., today (March 31) from 10 a.m.-7 p.m. and Saturday, April 1, from 10 a.m.-noon. There is no admission fee.

## WOMEN'S HISTORY MONTH

# Laboratory's Clark and Springer exemplify civic spirit

By Linda Lucchetti  
Newsline staff writer

Germaine Clark, administrator in Biosciences Directorate, believes in giving — both to her community at work and her community at home. Her list of achievements coupled with her enthusiastic approach, endorse her philosophy.

During her 26-year career at LLNL, she has served on several committees such as Daffodil Days, and the Lab's Cancer awareness program. Images of her hero, famed bicyclist and cancer survivor Lance Armstrong, are never far from view when you visit her office.

Clark's community efforts in her hometown of Tracy have been just as ambitious as those at the Lab, serving as publicity manager for the non-profit children's Dance Theatre presentation of the "Nutcracker" and chairing three teams for Tracy's West Valley Mall's "Evening of Giving."

After becoming LLLWA vice President last fall, Clark organized a presentation by Lab employees Celeste Matarazzo and Rose O'Brien, who along with Janis Turner, a retired Livermore teacher, bicycled across America to raise money for Tri-Valley's Hope Hospice. The talk attracted some 200 employees to the Bldg. 123 auditorium to hear the trio's adventures of their transcontinental journey.

As part of Women's History Month, Clark coordinated a presentation by author and educator Rosalyn Taylor O'Neale in conjunction with the Lab's Lesbian, Gay, Bisexual, and Transgender Association



Germaine Clark

(LGBTA), the Association of Black Laboratory Employees (ABLE); and the Work-life Center.

"Germaine brings a lot of energy and ideas that are making a difference within the Women's Association. She has done a terrific job coordinating events," said Women's Association President Yahel De La Cruz.

What inspires Clark's involvement in the LLLWA? "The caliber of professional women who are involved," she said.

"They strengthen me to do what I need to do. Being involved lets me use my organizational skills and meet a lot of people. It's rewarding and everything I learn complements my work in the Biosciences Directorate.

"I want to continue the enthusiasm



JACQUELINE MCBRIDE/NEWSLINE

Susan Springer

and passion that is the women's association. I want to figure out what people want and need and make things happen."

Susan Springer, a business manager in the Computation Directorate, became interested in the women's association shortly after she was awarded a scholarship by the group in 1984 — a scholarship that helped her finish a bachelor's degree that eventually led to her gaining a master's degree in business administration.

"The LLLWA is important because it provides encouragement to women, as well as networking and leadership opportunities," she said.

*In celebration of March as Women's History Month, the Lawrence Livermore Laboratory Women's Association (LLLWA) highlights members who exemplify the tradition of "making a difference."*

Springer knows about leadership opportunities. She has served as association vice-president, secretary and treasurer, as well as scholarship committee co-chair and historian.

In addition to the LLLWA, Springer has worked on the "Tri-Valley Expanding Your Horizons in Math and Science" conference held each year to introduce girls to careers in science and math.

Looking ahead, Springer is hopeful that the LLLWA membership will increase. "I think it's been very positive that we've been partnering to present different events with Lab networking groups like Amigos Unidos Hispanic Networking Group, LGBTA, the Veterans' Association and ABLE."

When asked how she is making a difference, Springer said, "I'm not making a difference. We are all making a difference together. The women of LLLWA are working together to accomplish many things. I am just a part of that."

## Scholarly achievements



JULIE KORHUMMEL/NEWSLINE

From left: Laboratory Director George Miller, Joni Dahl, Linh Couch, Laura O'Brien Cary Gellner, Irene Massiatt and Laurie Lane. (top) Edwin Tippens, Laura Gilliom and Carol Rivers.

The Lawrence Livermore Laboratory Women's Association (LLLWA) presented its annual scholarship awards, totaling \$3,300, to eight employees during a ceremony held this week. The scholarships have been a cornerstone of the association since 1984, providing financial support to Lab employees in their pursuit of educational training and as a means of career and personal advancement.

Keynote speaker Gilliom, director for University Relations Program presented the awards. "I am humbled and inspired by what you all accomplish," she told recipients.

George Miller attended the awards ceremony. "I understand what it means to devote this level of effort," he added, congratulating the scholarship recipients on their achievement.

## Strings attached



JACQUELINE MCBRIDE/NEWSLINE

Bennie Herrick of the Defense Technologies Engineering Division displays the 24-inch diameter, 67-pound ball composed of the 20.09 miles of string she has collected over the last 15 years from packages and mail that has come through her office. Herrick is retiring today.

## Web groups seeks comment on style guide

The first major project of the revived Web Working Group (WWG) — an interactive Wiki with links to a wide variety of Web development resources — was rolled out last week to the Lab's Web designers, developers and content providers.

Located on the LLNL Intranet at <https://caribou-r.llnl.gov/labweb/tiki-index.php>, the Wiki features a discussion forum; information on upcoming Web-related meetings, brown-bag lunches and seminars; people to contact for answers to questions; and an RSS (Really Simple Syndication) feed alerting users to recent updates to the site.

"We'll be adding additional features as we go along in response

to suggestions from users," said Willie Webb (CASC), who spearheaded the WWG revival and was responsible, along with Ralph Pombo and Jason Conkey (both CAR), for developing the new Wiki.

A current highlight of the Wiki is the opportunity to review and comment on the Lab's first Web Style Guide, currently under development by a committee headed by Thom Tegge (TID). The Wiki also has a link to the results of a comprehensive survey of Lab Web technologies and practices conducted by the WWG. To participate in the survey, go to <https://caribou-r.llnl.gov/survey/wwg/>.

## NEWSLINE

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## PEOPLE NEWS

### IN MEMORIAM

#### Roger W. Petersen

Roger W. Petersen, who retired from the Lab in June 2005, died March 2. He was 55.

Petersen worked in the Lab's Plant Engineering Department as a construction inspector for 37 years. His expertise was in suspect counterfeit material inspection.

He also was an OSHA construction training instructor, a welding inspector and general construction inspector.

He is survived by his wife Donna Petersen of Castro Valley and his father Robert Petersen of Castro Valley.

#### John Goots Jr.

John Goots, Jr., a former Livermore resident, died March 15 of natural causes in the Village Square Nursing Home in Southern California where he lived the past three years. He was 73.

Born May 25, 1932, in Clarksburg W. Va., he served in the U.S. Air Force from 1952–1956. He began his life-long work in the nuclear industry in Pittsburg, Pa., moving his family to California in 1963 to work at the Vallecitos Nuclear Generating Station. In later years he worked at LLNL.

Accepting a position at San

Onofre Nuclear Site in San Clemente, he relocated to Southern California in 1982.

Goots was an accomplished musician in his spare time, having played with the U.S. Air Force Band and private local bands.

He is survived by his wife of 53 years, Jeri Goots of San Diego; one son, John D. Goots of Sacramento; three daughters, Pamela Frank, formerly of Livermore, now of San Diego, Christi Genovese of San Clemente, and Leslie Goots, of Livermore. He also leaves 10 grandchildren and 10 great-grandchildren.

Services were held in Livermore.

#### Lee Shiozawa

Lee Shiozawa, a manufacturer of nonlinear and electro-optic crystals and devices, and co-founder of Cleveland Crystals Inc., died March 15.

Shiozawa was recognized for his work on scaling crystals to facilitate both the Shiva and Nova Laser projects at LLNL.

A native Californian, he left a World War II internment camp to attend Case Institute of Technology, where he graduated with honors with a bachelor's degree in chemical engineering in 1948 and a master's degree in 1950, and completed course work for his doctorate in physical chemistry in 1953.

Later, he managed research and development at Clevite Corp. (later Gould Inc.).

He was one of the founders of

Cleveland Crystals Inc. in 1973, serving as vice president/principal scientist, then president from 1979 to 1997 before becoming chairman and chief scientist.

He also developed the physical chemistry of beta-barium borate, along with that of the silver gallium sulfide/selenide and cadmium sulfide/selenide families of crystals.

He had key roles in the expanding fields of synthetic crystal growth and laser optics, providing enabling technologies for diverse applications, including tabletop lasers, giant inertial confinement fusion lasers, medical systems and infrared countermeasures.

He is survived by his wife, a daughter, a son and many grandchildren.

# O'Brien tapped to lead Reliable Replacement Warhead program

By David Schwoegler  
Newsline staff writer

Defense and Nuclear Technology Associate Director Bruce Goodwin has announced his appointment of K. Henry "Hank" O'Brien as Reliable Replacement Warhead (RRW) program manager.

O'Brien received his bachelor's degree from St. John's University in Minnesota in 1981, and master's and Ph.D. in theoretical high-energy physics from Brown University in 1984 and 1987, respectively. He joined the Laboratory in 1987 as a nuclear design physicist in A Division and participated in several nuclear tests.

In 1993, O'Brien spent six months at the Pentagon on assignment to the assistant to the Secretary of Defense for Atomic Energy. The next year he chaired

the Livermore Projects Committee, was co-chair of the U.S./UK Joint Working Group on weapon secondary physics, and also became a group leader in A Division.

O'Brien was Livermore's project leader for the W87 Life Extension Program, from its inception in 1994, through first production and Initial Operational Capability in 1999.

He accepted a two-year assignment to DOE Headquarters as science adviser to NA-12's David Beck, and to NA-11's David Crandall. Since returning to Livermore in late 2001, O'Brien has served on the DNT associate director's staff working on future stockpile issues.

The Lab's RRW program has teamed with Sandia California to participate in a competitive RRW feasibility study, overseen by the RRW project officer's group, under authorization from the Nuclear



Hank O'Brien

Weapons Council. The goal of the RRW study is to create a design that will sustain long-term confidence in a safe, secure and reliable stockpile. That design also should enable transformation to a responsive nuclear weapon infrastructure, within the constraints of the nuclear test moratorium.

According to Goodwin, O'Brien's broad experience and leadership in nuclear design, weapon project management, and interactions with NNSA and DoD agencies prepare him well for this assignment. He retains his responsibilities as evaluation and planning program manager.

O'Brien describes his new position as, "an exciting opportunity to affect the future of the nuclear weapons enterprise."

O'Brien was appointed March 20.

## Replacement warhead feasibility study to usher in new era

The design laboratory for the Reliable Replacement Warhead has not been selected. But whatever successful RRW design emerges, it must meet national security requirements for a safe, secure, reliable replacement warhead that includes all of the modern safety features and that can be certified without nuclear testing.

If implemented, RRW enables development of a more responsive and capable nuclear weapons infrastructure.

The RRW concept uses proven components and applies capabilities developed by the Stockpile Stewardship Program. The plan is to develop a design that lies well within the experiences — and within what can be called the "sweet spot" — of our historical test base. The RRW design would use replacement components and assemblies that are easier to manufacture than replacement parts for the current stockpile. An underground nuclear test would not be needed to resolve any technical issues with RRW.

The warheads would be safer to manufacture, more cost-effective to

produce, and less costly to maintain than existing warheads.

Initially, RRW would serve as a complement to the current Stockpile Life Extension Program

(LEP). Eventually RRW should prove to be a more cost-effective and reliable long-term replacement for LEP. As currently planned, RRW would change the weapons complex infrastructure by reducing the footprint for manufacturing, development, and testing facilities.

RRW should transform the nuclear weapons complex infrastructure through innovation in materials and fabrication techniques. For example, RRW pit production techniques significantly improve efficiency, to shrink the pit manufacturing facility footprint. Many hazardous materials used in current stockpile systems, and reused in LEPs, can be avoided in RRW.

Importantly, designers consider the entire weapon lifecycle from development to disposition. Ease of manufacture is followed by ease of maintenance.



nance.

Additionally, RRW must be highly responsive to DoD needs, such as fitting both Air Force and Navy vehicles and adapting to differing operational and security environments.

Livermore brings experience and expertise to the competition for RRW design development:

- Legacy of safety advances in stockpile.
- Advanced warhead security technologies.
- Integration with manufacturing to produce long-lived, stable nuclear explosive package.
- Successful development and application of stockpile stewardship tools.
- Recent successes in W87 and W80 LEPs.

• A history of working closely with Sandia/CA and NNSA production agencies.

No decision has been made whether to begin development of RRW for the stockpile. The feasibility study must be completed by November 2006.

By March 1, 2007, the secretary of energy and the secretary of defense must submit to the congressional defense committees a report on the feasibility and implementation of the RRW program. An interim report was due March 1, 2006.



### NAI

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strategically realigned so that each division provides end-to-end capabilities for its specific focus area," Juzaitis explained. "Efforts in support of policy initiatives and international partnerships are coupled with science and technology."

As an example of providing end-to-

end capabilities, Juzaitis cited the new RN Division, where programmatic activities range from threat assessment with the Nuclear Assessment Program to detection to consequence management to forensics and attribution.

The directorate's realignment process started last September and included confidential input from employees, one-on-one meetings with leadership teams, five working groups of NAI and non-NAI

employees, and external consultants.

Juzaitis thanked the people who contributed to the directorate's strategic vision and realignment effort. "This was a very inclusive process and I am very happy with the breadth of participation."

Any future changes will be based on strategic needs that align the directorate more closely with its sponsors and the changing global security environment, he said.

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